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Scientists divided on disease's risk to humans
Some see too many unknowns; others say meat is safe

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Despite continued reassurances by federal health authorities that meat from cattle infected with mad cow disease is safe, leading scientists who first found the cause of such illnesses insist that the actual risk is not known.

U.S. Department of Agriculture investigators are still trying to track down a batch of meat from 20 slaughtered cows that includes the lone Holstein in Washington state that tested positive last week for the brain-wasting illness also known as bovine spongiform encephalopathy, or BSE.

The infectious proteins called prions that cause mad cow disease have been found in abundance only in the brain stem, spinal cord and small intestine of infected cattle, tissues not included in the cuts of meat made from the doomed animal.

"Clinical studies tell us there's virtually zero risk for BSE in the meat, and that is what gives us confidence that the U.S. supply of beef remains safe," said Dr. Ken Petersen, of the USDA Food Safety Inspection Service, during a news conference Monday.

The 10 tons of meat were being recalled, Petersen added, only out of "an abundance of caution."

While studies have yet to find prions in the muscle tissue of infected beef cattle, scientists have found them in the muscles of mice, hamsters and humans.

UCSF researcher Dr. Stanley Prusiner, who won the Nobel Prize in 1997 for the discovery of prions, last year found them in the leg muscles of laboratory infected mice; German scientists have found them in muscles of infected hamsters.

Using super-sensitive tests, a Swiss study published in the New England Journal of Medicine last month found prions in 8 of 32 samples of muscle tissue taken from patients who died of variant Creutzfeldt-Jakob disease, a similar brain-wasting illness affecting humans.

Armed with such findings, Prusiner has advocated that all U.S. cattle slaughtered for human consumption be tested for mad cow disease.

"There are still too many unanswered questions for the government to be reassuring the public so strongly," Prusiner said in a telephone interview.

Currently, only about 20,000 of the 35 million cattle slaughtered in the United States each year -- or 1 out of 1,750 -- are tested for BSE. Most are "downer cows," animals that are unable to walk because of injury or illness and by their behavior show a higher potential of

having contracted the disease. The dairy cow in Mabton, Wash., was such a case. She had become partially paralyzed following the birth of her calf.

Yet USDA officials acknowledged yesterday that they did not know how many downer cows are slaughtered annually. The system of testing suspect cows is designed as a surveillance tool that, by sampling the most suspicious animals, could reliably pick up mad cow disease in the U.S. if as few as one in 1 million cows have it.

That system is now up for review, and the pressure is on to adopt a European-style system of massive cattle testing at slaughter.

"I think it's time for people in government to introduce a seamless testing program that could test every one of America's 35 million cows," Prusiner said.

Prusiner acknowledges that he could gain financially from such a program. He is a co-founder of InPro Biotechnology of South San Francisco, a company that has developed a rapid test for mad cow disease and a device that can process 8,000 test results per day.

Dean Cliver, a UC Davis expert on food safety, believes that a large scale mad cow disease testing program may now be inevitable, but he does not believe it is necessary or wise.

"The United Kingdom has invested a fortune in testing red meat, milk and milk products (from infected cows), and they have yet to detect a single prion, " he said. "These are highly competent people, and they've yet to find anything."

Worldwide, there have been 153 cases of variant Creutzfeldt-Jakob disease, the illness caused by eating prion-infected beef. Researchers believe the infections were caused when the victims ate processed meat that contained prion-infected brain or nerve tissue. Only one American -- who had lived in Britain at the height of transmission from beef there -- has come down with the illness in the United States.

The lone cow in Washington state is the first to test positive in the United States; a single beef cow tested positive in Alberta, Canada, last May.

Nevertheless, Cliver believes that public pressure and international trade concerns are likely to bring on a massive and costly mad cow disease testing program. "It will be taking money from the testing for food-borne diseases that are killing people in the United States, such as E. coli O157/H7, " he said.

According to the federal Centers for Disease Control and Prevention, food- borne illnesses afflict 76 million Americans a year, killing an estimated 5, 000.

In light of testing that has not turned up prions in the meat of infected cattle, Cliver said the laboratory findings of prion researchers were not significant. "I promise not to eat hamsters, or humans," he said.

But Jiri Safar, a researcher at Prusiner's UCSF Institute for Neurodegenerative Diseases, cautions that the discovery of prions in muscle tissue should not be taken lightly.

Although prions are primarily associated with nerve cells in the brain and spinal cord, he

notes that muscle tissue itself is laced with nerves. "Large nerves branch, and finish in muscle tissue," he said. "Muscles move because they intimately relate to nerves, which supply the signals for movement." To assume some sort of separation of nerve tissue from muscle tissue "is not anatomically correct," he added.

Safar, who says he no longer eats red meat himself, said that the minimum dose of prion-infected brain tissue known to cause disease is the equivalent of one-fifth of a drop of water.

The UCSF researcher, who also holds stock in InPro, contends that tests to determine conclusively whether BSE prions exist in the muscles of beef cattle have yet to be completed.

Safar credits Britain's policy of destroying all cattle more than 30 months old with reducing the transmission of mad cow disease, but he said that does not eliminate the threat. "The only way to do it completely," he said, "is to test every animal."

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